Journal of Bionursing
2024, VOL.6, NO. 3, 271-278

The Effect of Guided Imagery Techniques on Elderly Blood Pressure Hypertension in South Purwokerto

Mega Putri Utami[1], Adiratna Sekar Siwi [2]✉, Suci Khasanah[3]

[1, 2, 3] Faculty of Health, Universitas Harapan Bangsa Purwokerto, Indonesia
Correspondence Author : adiratnasekarsiwi@uhb.ac.id

ABSTRACT

Background: Hypertension has become a leading cause of death globally, often referred to as "The Silent Killer." The therapeutic management of hypertension includes both pharmacological and non-pharmacological approaches, one of which is guided imagery relaxation.
Objective: To assess the influence of guided imagery relaxation techniques on blood pressure in elderly individuals with hypertension in South Purwokerto.
Method: This study utilizes a quasi-experimental design with a pretest-posttest control group, employing purposive sampling to obtain 30 control and 30 intervention groups of elderly individuals with hypertension. The intervention includes guided imagery techniques via video and audio guides for 10-15 minutes before sleep over one week. Measurements are taken before and after the intervention from days one to six. Statistical analyses involve the Paired T-Test, Mann Whitney U, and Wilcoxon Signed Rank tests.
Results: The analysis of blood pressure using the Mann-Whitney U test shows a p-value of 0.000 for systolic pressure and 0.014 for diastolic pressure. The Paired T-test results indicate a p-value of 0.000 for systolic intervention and 0.021 for diastolic control. The Wilcoxon Signed Rank test results show a p-value of 0.393 for systolic control and 0.000 for diastolic intervention.
Conclusion: Guided imagery significantly lowers both systolic and diastolic blood pressure in the intervention group compared to the control group (p-value < 0.05). It is recommended as an effective therapy for hypertension in the elderly, underscoring the need for meticulous nursing care documentation.

KEYWORDS
Blood Pressure, Elderly, Guided Imagery, Hypertension

INTRODUCTION

Hypertension or high blood pressure is a non-communicable disease. Hypertension is a disorder of the cardiovascular system that occurs in the blood vessels of the heart, which are suppressed due to increased blood circulation [World Health Organization (WHO), 2021]. Hypertension is a disease that can increase the risk of stroke, brain disorders, and coronary heart disease. Hypertension is the biggest cause of death in the world and is called “The Silent Killer” (Samsu et al., 2020). As we get older, degenerative diseases will be experienced by the elderly due to decreased physiological function.

The elderly will be susceptible to disease. One of them is hypertension. The highest prevalence of hypertension is suffered by those aged 60 years and over. The prevalence of hypertension is based on data from the Banyumas Regency Office in 2021, and the highest ranking is in Jatilawang District with 15,136 people. The second rank was in the South Purwokerto District with 11,316 people, while the lowest was in the Pekuncen II area with 1,577 people [Dinas Kesehatan Kabupaten Banyumas (Dinkes), 2021].

The occurrence of hypertension in the uncontrolled group, as indicated by blood pressure measurements, is influenced by various factors. These include smoking, environmental factors, alcohol consumption, stress, high salt intake, poor sleep quality, hormonal disorders, kidney problems, obesity, blood disorders, and diabetes. These factors collectively contribute to this group's lack of control over blood pressure levels. Understanding and addressing these diverse factors are essential for effective hypertension management and prevention

(Nafiah et al., 2020). Poor lifestyle compliance, medication non-adherence, and excessive physical activity can complicate blood pressure control. Pharmacological therapy, the primary treatment for hypertension, has potential long-term side effects. Non-pharmacological therapies like deep breathing, guided imagery, exercise, and a healthy diet can complement medication. Integrating both approaches is often recommended for effective hypertension management (Yulistika & Sulistiyowati, 2022).

This guided imagery relaxation technique can be used as a non-pharmacological therapy for the treatment of hypertension. Non-pharmacological management of hypertension is highly recommended because apart from being able to be done independently, it also has minimal side effects. In the elderly, non-pharmacological therapy can also reduce mortality and morbidity. Hypertension can cause complications if not handled appropriately, like decreased organ function, stroke, heart failure, permanent disability, or even death (Nafiah et al., 2020). Guided imagery or guided imagination relaxation techniques with hypnotherapy will create a situation or event with a calm, relaxed atmosphere. Reduces the stress response and relaxes smooth muscles in the heart's blood vessels; thus, blood pressure can decrease (Setyani et al., 2019). Given the high prevalence of hypertension, particularly in the South Purwokerto region, and considering the limited awareness of complementary therapies, the researchers are intrigued to investigate the potential of a less widely known approach. The proposed study will focus on "the effect of guided imagery relaxation on blood pressure in the elderly with hypertension in South Purwokerto." This research aims to explore the impact of guided imagery as a complementary therapy for hypertension, providing valuable insights into its effectiveness and potential benefits in the specific context of South Purwokerto.

METHODS

Population and Sample

This research employs a quasi-experimental design with a pretest and posttest, utilizing a control group. The study was conducted from May 25 to June 6, 2023. The research site is within the service area of the South Purwokerto Community Health Center, specifically in the villages of Karangpucung and Karangklesem. Sampling was carried out by consecutive sampling, with 60 elderly hypertensive respondents—30 in the intervention group and 30 in the control group.

Instrument

The instrument utilized for blood pressure measurement is a digital sphygmomanometer. The Guided imagery relaxation techniques from the guided imagination relaxation technique uses audio video media that contains directions and guidance for deep breathing relaxation and is followed by being guided by the respondent to imagine being in a rural atmosphere with views of rice fields, waterfalls, and clear rivers with a duration of 10-15 minutes each night for a week. Measurements were taken before and after the guided imagery intervention on the sixth day.

Analysis

The analysis employed in this study includes the Paired T-Test, Wilcoxon Signed Rank, and Mann Whitney U tests. The research has received approval from the Ethics Commission of the University of

Harapan Bangsa, with approval number B. LPPM-UHB/1832/05/2023.

RESULT AND DISCUSSION

Characteristics Respondent

Table 1. Frequency distribution of characteristics based on gender, Body Mass Index (BMI), smoking habits, family history, marital status, and employment in 2023 (n=60)

Characteristic	Intervention Group		Control Group	
	n (30)	% (100)	n (30)	% (100)
Gender				
Man	8	2.7	12	40
Woman	22	73.3	18	60
BMI				
Thin	2	6.7	3	10
Normal	16	53.3	19	63.3
Obesity risk	9	30	7	23.3
Obesity	3	10	1	3.3
Smoking habit				
Do not smoke	27	90	24	80
Heavy smoker	2	6.7	4	13.3
Moderate smoker	1	3.3	2	6.7
Light smoker	0	0	0	0
Family history				
Hypertension	28	93.3	27	90
DM	2	6.7	3	10
Marital status				
Divorced	2	6.7	0	0
Death divorce	11	36.7	5	16.7
Marry	17	56.7	25	83.3
Work				
IRT	9	30	14	46.7
Laborer	5	16.7	10	33.3
Self-employed	3	10	4	13.3
Trader	6	20	2	6.7
Retired	7	23.3	0	0

Table 1 indicates that in the intervention group, 22 respondents (73.3%) identified as female, while in the control group, 18 respondents (60%) were women. Concerning BMI, 16 respondents (53.3%) in the intervention group and 19 respondents (63.3%) in the control group fell within the normal category. Examining smoking habits, 24 respondents (80%) in the control group had the habit, while 27 respondents (90%) in the intervention group did not smoke.

Regarding family history, almost all respondents in both groups had a family history of hypertension: 28 respondents (93.3%) in the intervention group and 27 respondents (90%) in the control group. Regarding marital status, 25 respondents (83.3%) in the control group were married, compared to 17 respondents (56.7%) in the intervention group.

Furthermore, examining work-related characteristics, 14 respondents (46.7%) in the control group worked as temporary housewives, while in the intervention group, 9 respondents (30%) were engaged in similar work.

Blood Pressure Before and After Guided Imagery

Table 2. Differences in blood pressure between group interventions and group control using the Mann-Whitney U test

Blood pressure	Before			After		
	GI (intervention) n=30 Means (min-max)	GI (control) n=30 Means (min-max)	*P-value*	GI (intervention) n=30 Means (min-max)	GI (control) n=30 Means (min-max)	*P-value*
Systolic	154 (140-170)	154 (145-180)	0.380	137 (110-165)	156 (108-198)	0.000
Diastolic	96 (90-109)	98 (90-110)	0.238	86 (71-113)	93 (74-123)	0.014

Table 3. Differences in blood pressure before and after group intervention given guided imagery and group control using the Wilcoxon Stign Rank test and paired T-test.

Table 3. Differences in blood pressure before and after group intervention given guided imagery and group control using the Wilcoxon Stign Rank test and paired T-test

Blood pressure	Intervention group (n=30)			Control group (n=30)		
	Before Means (min-max)	After Mean (min-max)	*P-value*	Before Means (min-max)	After Means (min-max)	*P-value*
Systolic	154 (140-170)	137 (110-165)	0.000	154 (145-180)	156 (108-198)	0.393
Diastolic	96 (90-109)	86 (71-113)	0.000	98 (90-110)	93 (74-123)	0.021

The systolic and diastolic blood pressure in the intervention group demonstrated improvement after guided imagery treatment, as illustrated in Tables 2 and 3. The mean values in the intervention group before the intervention were systolic 154 mmHg and diastolic 96 mmHg. After the intervention, the mean systolic value decreased to 137 mmHg, showing a reduction of 17 mmHg, and the mean diastolic value decreased to 86 mmHg, reflecting a reduction of 10 mmHg.

In the control group, before receiving guided imagery intervention, the mean systolic value was 154 mmHg, and diastolic was 98 mmHg. After the guided imagery intervention, the mean systolic value increased to 156 mmHg, indicating a small increase of 2 mmHg. In comparison, the mean diastolic value decreased to 93 mmHg, demonstrating a reduction of 5 mmHg.

The statistical analysis of the results revealed no significant difference in the manner of systolic or diastolic blood pressure in the intervention group compared to before guided imagery treatment, with a p-value of 0.000, which is below 0.05. Conversely, in the control group, there was a similarity in the statistical manner of systolic blood pressure after compared to before guided imagery treatment, with a p-value exceeding 0.05 (0.393). However, in the control group, for diastolic blood pressure, there was a significant difference statistically compared to before guided imagery treatment, with a p-value of 0.021.

Discussion

The research findings, encompassing 60 elderly respondents with hypertension, revealed that 40 of them were women, while the remaining respondents were men. This observation aligns with Akbar's research (2020), indicating that individuals of the male sex are less prone to experiencing hypertension compared to females, particularly during the onset of middle adulthood. The study involved respondents aged 60-74 years, signifying that women in the sample had already undergone menopause.

During menopause, women experience a decrease in the hormone estrogen. Estrogen functions as a protective agent for blood vessels, preventing easy breakage. According to Akbar et al. (2020), the decrease in estrogen levels leads to an increase in LDL cholesterol (Low-Density Lipoprotein) and a decrease in HDL cholesterol (High-Density Lipoprotein). This imbalance influences the elasticity of blood vessels, resulting in atherosclerosis and an elevation in blood pressure.

Various factors influence hypertension, and one of them is Body Mass Index (BMI). Individuals in the obesity category are particularly prone to experiencing elevated blood pressure due to the accumulation of fat in the blood vessels. This accumulation of fat can lead

to a condition known as atherosclerosis, where fatty deposits build up in the arteries and narrowing them.

Atherosclerosis, in turn, can contribute to the constriction of blood vessels and disrupt the normal functioning of the heart's vascular system. As a result, the cardiovascular system experiences increased resistance, leading to higher blood pressure levels. Therefore, maintaining a healthy BMI is crucial in preventing the accumulation of fat in the blood vessels and mitigating the risk of hypertension (Sari, 2017). Smoking is a significant factor in hypertension, leading to elevated blood pressure and pulse. Smoking damages the endothelium layer of blood vessels due to carbon monoxide and nicotine in cigarettes, accelerating the development of spurious atherosclerosis and increasing the workload on the heart (Oktaviani et al., 2022).

Individuals with a family history of hypertension are at a higher risk compared to those without such a familial background. Primary hypertension, also known as essential hypertension, is more prevalent in monozygotic individuals compared to heterozygotes. The presence of hypertension in parents has been linked to an increased risk of hypertension in their children (Sukmaningtyas & Utami, 2020). Moreover, Indirect factors like marital status contribute to hypertension, influencing stress and lifestyle. Marital status affects physiological systems such as cardiovascular, sensory nerves, immune, and endocrine systems. For example, widowed individuals may experience heightened stress, potentially leading to hypertension and impacting overall health and well-being (Pramitasari & Hary Cahyati, 2022).

According to the data presentation from the Mann-Whitney U test results in Tables 2 and 3, the p-values for both systolic and diastolic blood pressure in the control and intervention groups after guided imagery treatment were obtained. For systolic blood pressure, the p-value was 0.000, and for diastolic blood pressure, it was 0.014 in the intervention group. Both types of blood pressure exhibited p-values below 0.05, indicating a significant influence of guided imagery in the intervention group.

In contrast, the control group, which did not receive guided imagery treatment, did not show a significant change in systolic or diastolic blood pressure, aligning with the expected outcome. This finding is consistent with the results reported by Lufianti and Sutrisno (2019), who, through the Mann-Whitney U-test, obtained p-values of 0.000 for both diastolic and systolic blood pressure. Therefore, there is a significant difference in systolic and diastolic blood pressure between the control and intervention groups. Relaxation therapy, such as guided imagery, may contribute to lowering cortisol levels, a stress hormone associated with increased blood pressure.

The presented findings are consistent with the research conducted by Afrioza et al. (2023), who investigated the Influence of Guided Imagery Techniques on Hypertension in the Elderly in Ward Kutabumi, Tangerang. According to their results, there was a significant decrease in diastolic blood pressure after treatment, with a p-value of ≥ 0.05. This suggests that the guided imagery technique effectively lowered diastolic blood pressure. The results of research conducted by Yeci (2020) also obtained results showing p value > 0.05, which indicates no significant

influence of guided imagery on systolic or diastolic blood pressure. The assumption behind employing guided imagery relaxation techniques is that it induces a calm and relaxed state, stimulating the release of endorphins—hormones that control heart rate and widen blood vessels, ultimately contributing to blood pressure reduction. This is proven by research conducted by Oktaviani and Nur (2019), which emphasizes that hypertension in the elderly is linked to narrowed blood vessels, affecting vessel elasticity. Guided imagery techniques can influence the parasympathetic nervous system, controlling heart rate and releasing endorphins, thus addressing muscle stiffness and lowering blood pressure. The positive impact of focused guided imagery on health problems highlights that thinking positively about a disease can lower anxiety levels and subsequently improve blood pressure (Trisna Aji et al., 2022)). Stress is a significant factor that can influence blood pressure. The impact of stress on blood pressure is attributed to the activation of the sympathetic nervous system. When an individual experiences stress, the sympathetic nervous system becomes more active, leading to increased resistance in the blood vessels. Prolonged exposure to stress can have a substantial effect on elevating blood pressure.

The heightened activity of the sympathetic nervous system also prompts an increase in the workload of the heart muscles. This is because the heart needs to pump blood more forcefully to overcome the elevated resistance in the blood vessels, further contributing to an increase in blood pressure. Therefore, managing stress is crucial not only for overall well-being but also for maintaining healthy blood pressure levels. Strategies such as relaxation techniques, exercise, and stress management practices can play a significant role in mitigating the impact of stress on blood pressure (Irawan et al., 2020). Relaxation methods can lower pulse rates by suppressing the sympathetic nervous system's stress response. These techniques promote the relaxation of smooth muscles in blood vessel walls and trigger the release of endorphins, which help modulate stress-related neurotransmitters like catecholamines. This modulation helps prevent an increase in blood pressure and pulse rate, fostering a sense of calm and well-being (Setyani et al., 2019).

Researchers assume that the circumstances of each respondent influenced declined blood pressure. The more increase age increases, the more pressure blood pressure decreases, causing The disappearance of the elasticity of arteries as a consequence of natural changes in the vessel's blood. Eating patterns and lifestyle choices significantly affect blood pressure. Factors like high salt intake, nicotine, and caffeine can elevate blood pressure, while antihypertensive medications and non-pharmacological therapies can lower it. Modifying eating habits—reducing salt and avoiding certain substances—positively impacts blood pressure. Non-pharmacological therapies, like guided imagery, are recommended for the elderly to manage hypertension without side effects. Guided imagery, a standard therapy, helps reduce anxiety, induce relaxation, and address various health issues, making it effective across different age groups (Sumarliyah et al., 2018).

CONCLUSIONS

The respondents in the study were predominantly female, with normal BMI, no smoking habit, a family history of hypertension, married, and working as housewives. After guided imagery intervention, the intervention group showed a significant decrease in systolic and diastolic blood pressure compared to the control group (138 mmHg and 85 mmHg vs. 157 mmHg and 95 mmHg, respectively), with a p-value < 0.05. This indicates that guided imagery relaxation has a positive impact on lowering blood pressure in elderly individuals with hypertension in the South Purwokerto public health center. The limitations of this research are that daily lifestyle variables, physical activity, respondents' daily emotional responses, eating patterns, problems experienced by respondents, and respondents who lack concentration and do not follow directions in carrying out relaxation techniques were not measured, so the possibility of bias could occur. The technique is considered safe and independent, and the researchers suggest further studies exploring the use of guided imagery through video media and its combination with complementary therapies to leverage technological advancements in lowering stress and blood pressure levels.

REFERENCES

Afrioza, S., Mustika, F. and Novita Amaris Susanto, B. (2023) 'Pengaruh Teknik Imajinasi Terpimpin Terhadap Hipertensi Pada Lanjut Usia di Kelurahan Kutabumi Tangerang', *Jurnal Delima Harapan*, 10(1).

Akbar, F., Nur, H., Humaerah. (2020) Karakteristik Hipertensi Pada Lanjut Usia Di Desa Buku (Characteristics Of Hypertension In The Elderly), *Jurnal Wawasan Kesehatan,* 5(2), 2548-4702.

Dinas Kesehatan Kabupaten Banyumas (2021) 'Profil Kesehatan Kabupaten Banyumas Tahun 2021', *IT - Information Technology*, 48(1), 6–11.

Irawan, D., Siwi, A.S. and Susanto, A. (2020) 'Analisis Faktor-Faktor Yang Memengaruhi Kejadian Hipertensi', *Jurnal of Bionursing*, 3(2), 164–166. https://doi.org/10.20884/1.bion.2020.2.3.70.

Lufianti, A. and Sutrisno (2019) 'Efektifitas Terapi Relaksasi Imajinasi Terbimbing Menurunkan Tekanan Darah Pada Lansia Hipertensi Di Wilayah Kerja Puskesmas Purwodadi 1 Kabupaten Grobogan', *Media Keperawatan Indonesia*, 2(2). https://doi.org/10.26714/mki. 2.2.2019.25-30.

Nafiah, D., Pertami, S.B. and M. (2020) 'Efektifitas Guided Imagery Dan Slow Deep Breathing Terhadap Penurunan Tekanan Darah Pada Pasien Hipertensi Di Rsud Dr. R. Soedarsono Pasuruan', *Journal of Applied Nursing (Jurnal Keperawatan Terapan)*, 6(01), 01. https://doi.org/10.31290/jkt.v6i01.395.

Oktaviani, E. Noor Prastia, T., Dwimawati, E.. (2022) 'Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Pada Pra Lansia Di Puskesmas Bojonggede Tahun 2021', *Jurnal Mahasiswa Kesehatan Masyarakat*, 5(2), 135. https://doi.org/10.32832/pro.v5i2.6148.

Oktaviani, M. and Nur, H.A. (2019) 'Pemberian Relaksasi Imajinasi Terbimbing Untuk Penurunan Tekanan Darah Pada Lansia Penderita Hipertensi di Wilayah Puskesmas Jepang Kecamatan Mejobo Kabupaten Kudus', *Jurnal Profesi Keperawatan*, 6(2), 163–176.

Pramitasari, A. and Hary Cahyati, W. (2022) 'Kejadian Hipertensi pada Lansia di Wilayah Kerja Puskesmas Banyudono 1 Kabupaten Boyolali', *Higeia Journal Of Public Health Research And Development*, 6(4). https://doi.org/10.15294/higeia/v6i4/57037.

Samsu, S.H., Budiono, B. and Mustayah, M. (2020) 'Pengaruh Kombinasi Diaphragmatic Breathing Exercise Dan Guided Imagery Terhadap Perubahan Tekanan Darah Pada Pasien Hipertensi Di Ruang Interna I Rsud Dr. R. Soedarsono Kota Pasuruan', *Journal of Applied Nursing (Jurnal Keperawatan Terapan)*, 5(2), 155. https://doi.org/10.31290/jkt.v5i2.1015.

Sari, Y.N.I. (2017) *Berdamai Dengan Hipertensi*. Jakarta. Tim Bumi Merdeka.

Setyani, H.I., Arifianto and Rohana, N. (2019) 'Pengaruh Terapi Relaksasi Guided Imagery Terhadap Tekanan Darah Pada Lansia Penderita Hipertensi', *Jurnal Ners Widya Husada*, 6(2), 542–550. https://doi.org/10.52523/maskermedika.v9i2.468.

Sukmaningtyas, W. and Utami, T. (2020) 'Faktor Risiko Hipertensi pada Lansia', *Atlantis Press*, 20(Icch 2019), 215–221.

Sumarliyah, E., Nasrullah, D., Lailatul B, F., & Afifah, Z. (2018) 'Penurunan Tekanan Darah Dengan Relaksasi Autogenik Dan Guided Imagery Pada Pasien Hipertensi', *Jurnal Manajemen Kesehatan Yayasan RS Dr. Soetomo*, 4(2), 144–152.

Trisna Aji, P., Rizkasari, E. (2022) 'Pengaruh Terapi Guided Imagery terhadap Perubahan Tekanan Darah pada Penderita Hipertensi di Wilayah Puskesmas Jayengan Surakarta', *Aisyiyah Surakarta Jurnal Of Nursing*, 3(2). https://doi.org/10.30787/asjn.v3i2.896.

World Health Organization (2021) *Hypertension Indicators For Improving Quality And Coverage Of Service (Issue March)*. Swiss: World Health Organization.

Yeci, Y. (2020) *Pengaruh Terapi Guided Imagery Terhadap Respon Fisiologis dan Kualitas Tidur Pasien CHF di PJT RSUP Dr. Wahidin Sudirohusodo Makassar*. Diakses pada tanggal 26 Juli 2023, dari website Repository Universitas Negri Hasanuddin. Website: http://repository.unhas.ac.id/id/eprint/1186/.

Yulistika, D. and Sulistiyowati, R. (2022) 'Pemantaun Tekanan Darah Dan Terapi Non Farmakologi Pada Kegiatan Posyandu Lansia Di Ranting Aisyiyah Karangnanas'. *jurnal pengabdian masyarakat Al-Irsyad*, 4(1), 91–100. ttps://doi.org/10.36760/jpma.v4i1.375.